1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-4}{3}, \frac{4}{5}, \text{ and } \frac{6}{5}$$

A. $a \in [70, 77], b \in [-53, -41], c \in [-130, -119],$ and $d \in [86, 98]$

B. $a \in [70, 77], b \in [50, 55], c \in [-130, -119],$ and $d \in [-100, -88]$

C. $a \in [70, 77], b \in [-53, -41], c \in [-130, -119],$ and $d \in [-100, -88]$

D. $a \in [70, 77], b \in [-251, -249], c \in [271, 273],$ and $d \in [-100, -88]$

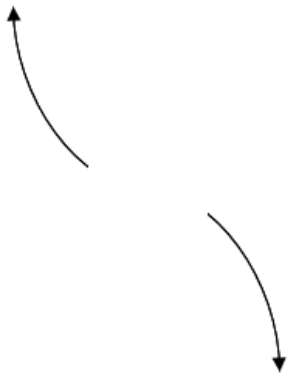
E. $a \in [70, 77], b \in [-131, -126], c \in [-33, -27],$ and $d \in [86, 98]$

---

2. Describe the end behavior of the polynomial below.

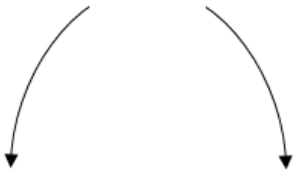
$$f(x) = 5(x-7)^4(x+7)^5(x-4)^3(x+4)^3$$

A.

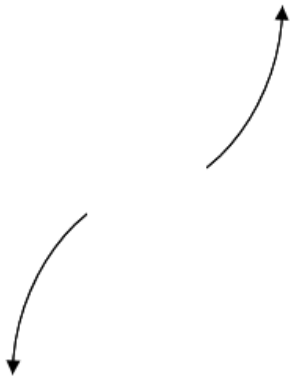


C.

B.



D.



E. None of the above.

---

3. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-2 + 4i \text{ and } 1$$

A. $b \in [0.7, 1.4], c \in [-6, -3],$ and $d \in [2, 11]$

B. $b \in [0.7, 1.4], c \in [-1, 5],$ and $d \in [-9, 0]$

C. $b \in [-6.9, -1.6], c \in [14, 23],$ and $d \in [13, 26]$

D. $b \in [1.6, 6.2], c \in [14, 23],$ and $d \in [-25, -14]$

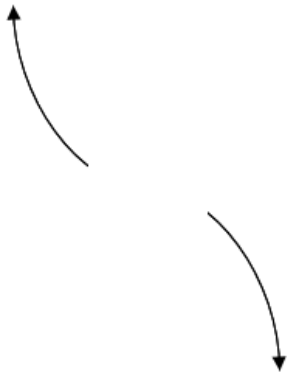
E. None of the above.

---

4. Describe the end behavior of the polynomial below.

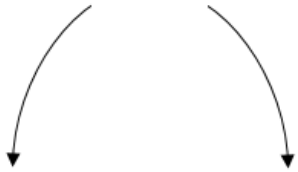
$$f(x) = -4(x-4)^5(x+4)^{10}(x+6)^3(x-6)^5$$

A.

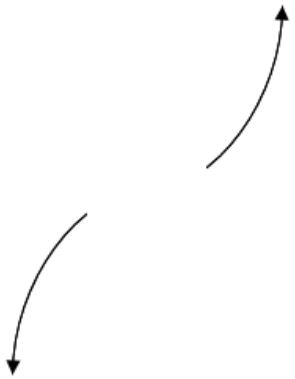


C.

B.



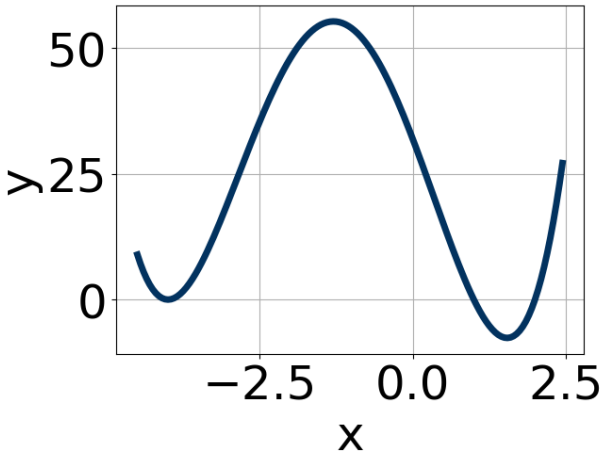
D.



E. None of the above.

---

5. Which of the following equations *could* be of the graph presented below?



A. $10(x+4)^6(x-1)^{11}(x-2)^5$

B. $10(x+4)^8(x-1)^{10}(x-2)^5$

C. $-12(x+4)^4(x-1)^5(x-2)^8$

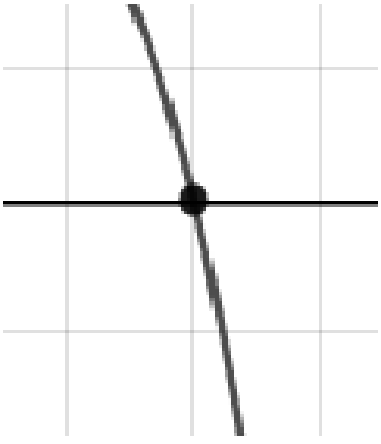
D. $-6(x+4)^{10}(x-1)^{11}(x-2)^{11}$

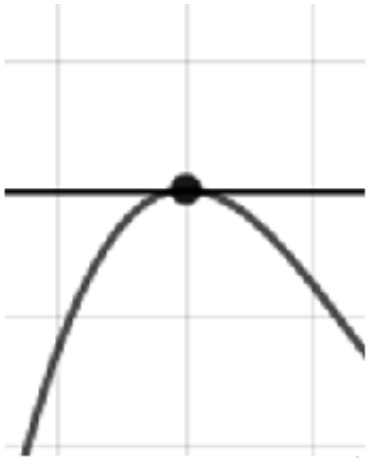
E. $17(x+4)^7(x-1)^{10}(x-2)^5$

---

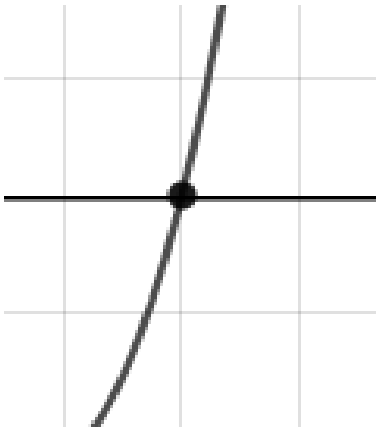
6. Describe the zero behavior of the zero $x=-5$ of the polynomial below.

$$f(x) = -9(x-5)^2(x+5)^7(x+7)^8(x-7)^{10}$$

A. 

B. 

C. 

D. 

E. None of the above.

---

7. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-2 - 3i \text{ and } 2$$

A. $b \in [-2.71, -1.5], c \in [3.3, 9.2],$ and $d \in [22.8, 26.7]$

B. $b \in [1.42, 2.12], c \in [3.3, 9.2],$ and $d \in [-26.6, -24.8]$

C. $b \in [0.14, 1.15], c \in [0.2, 1.1],$ and $d \in [-7.3, -4.4]$

D. $b \in [0.14, 1.15], c \in [-3.6, 0.6],$ and $d \in [-4.4, -1.3]$

E. None of the above.

---

8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-1}{4}, 7, \text{ and } \frac{7}{5}$$

A. $a \in [18, 22], b \in [-170, -159], c \in [152, 163],$ and $d \in [42, 51]$

B. $a \in [18, 22], b \in [106, 113], c \in [-227, -221],$ and $d \in [42, 51]$

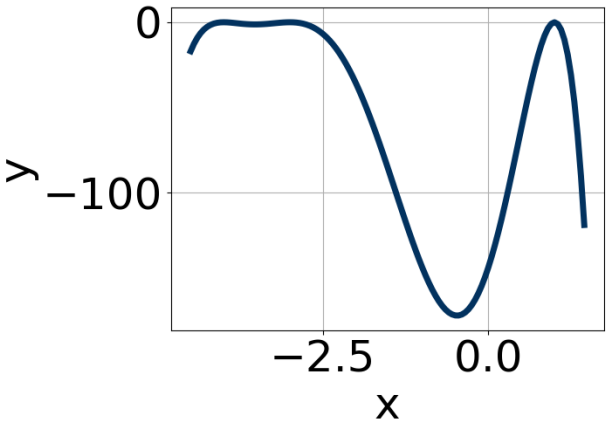
C. $a \in [18, 22], b \in [-178, -171], c \in [231, 239],$ and $d \in [-53, -47]$

D. $a \in [18, 22], b \in [159, 164], c \in [152, 163],$ and $d \in [-53, -47]$

E. $a \in [18, 22], b \in [-170, -159], c \in [152, 163],$ and $d \in [-53, -47]$

---

9. Which of the following equations *could* be of the graph presented below?



A. $-20(x+4)^{10}(x+3)^{5}(x-1)^{7}$

B. $9(x+4)^{8}(x+3)^{8}(x-1)^{9}$

C. $10(x+4)^{4}(x+3)^{10}(x-1)^{6}$

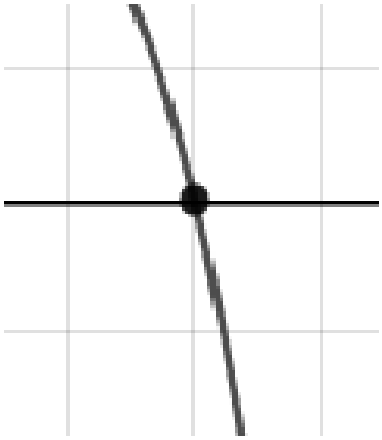
D. $-3(x+4)^{6}(x+3)^{6}(x-1)^{8}$

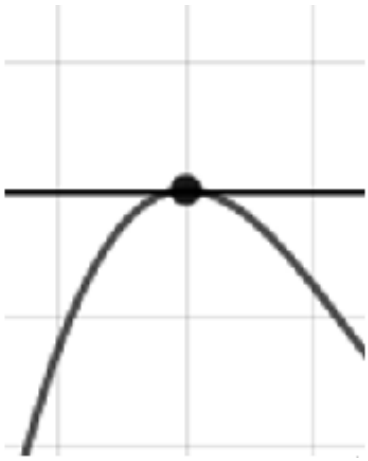
E. $-16(x+4)^{6}(x+3)^{4}(x-1)^{5}$

---

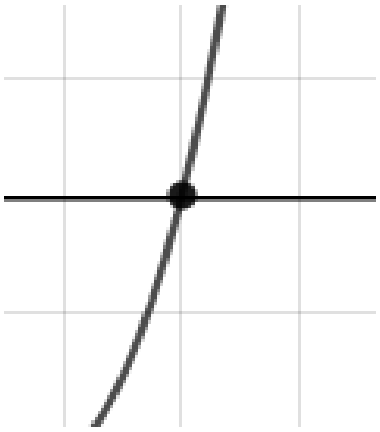
10. Describe the zero behavior of the zero $x = 7$ of the polynomial below.

$$f(x) = -7(x+7)^{5}(x-7)^{10}(x-4)^{4}(x+4)^{7}$$

A. 

B. 

C. 

D. 

E. None of the above.

---

11. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-7}{4}, -1, \text{ and } -3$$

A. $a \in [2, 5], b \in [21, 29], c \in [37, 41],$ and $d \in [-23, -18]$

B. $a \in [2, 5], b \in [21, 29], c \in [37, 41],$ and $d \in [20, 22]$

C. $a \in [2, 5], b \in [-24, -16], c \in [37, 41],$ and $d \in [-23, -18]$

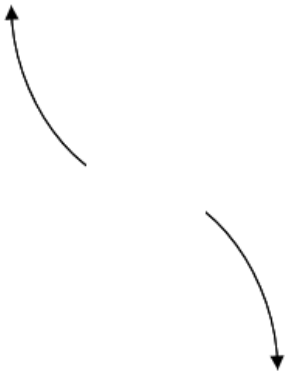
D. $a \in [2, 5], b \in [6, 12], c \in [-19, -11],$ and $d \in [-23, -18]$

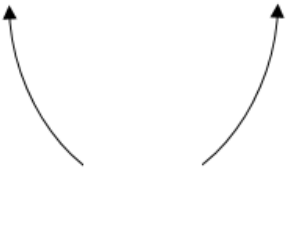
E. $a \in [2, 5], b \in [0, 3], c \in [-33, -25],$ and $d \in [20, 22]$

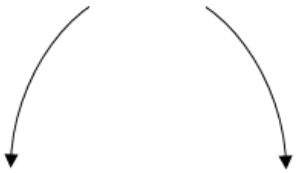
---

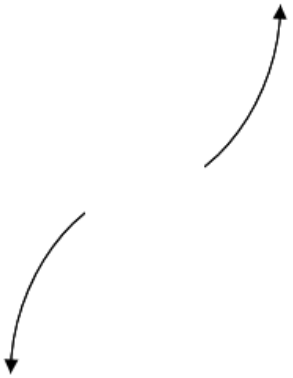
12. Describe the end behavior of the polynomial below.

$$f(x) = 5(x+4)^2(x-4)^3(x+8)^5(x-8)^6$$

A.


C.


B.


D.


E. None of the above.

---

13. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$4 - 5i \text{ and } 4$$

A. $b \in [-13, -11], c \in [71, 74],$ and $d \in [-171, -156]$

B. $b \in [9, 15], c \in [71, 74],$ and $d \in [156, 167]$

C. $b \in [-6, 2], c \in [-11, -2],$ and $d \in [16, 20]$

D. $b \in [-6, 2], c \in [-1, 11],$ and $d \in [-28, -19]$

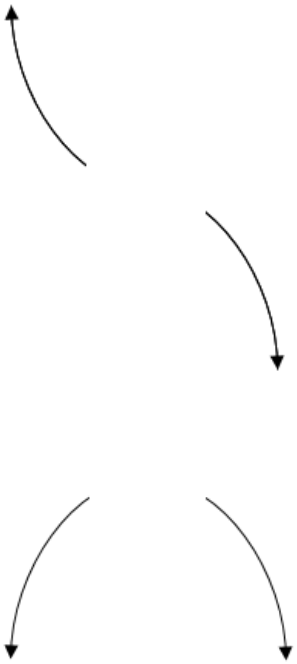
E. None of the above.

---

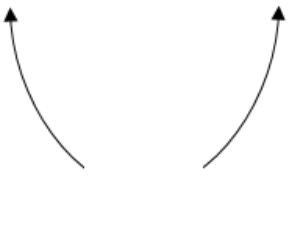
14. Describe the end behavior of the polynomial below.

$$f(x) = -2(x+7)^3(x-7)^4(x-8)^3(x+8)^5$$

A.

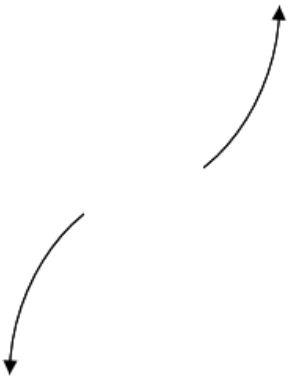


C.



B.

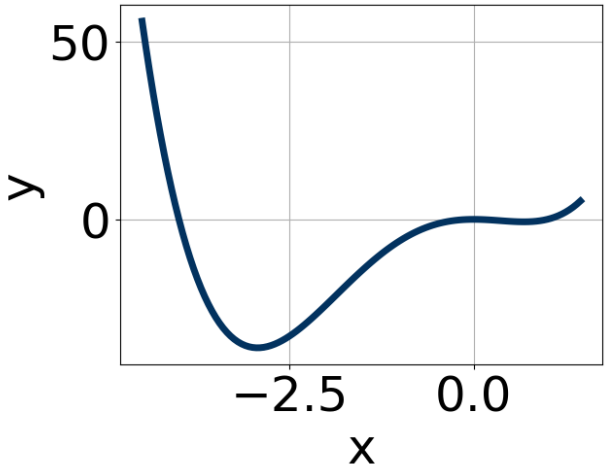
D.



E. None of the above.

---

15. Which of the following equations *could* be of the graph presented below?



A. $-7x^{10}(x-1)^9(x+4)^8$

B. $16x^{10}(x-1)^5(x+4)^9$

C. $-12x^8(x-1)^9(x+4)^9$

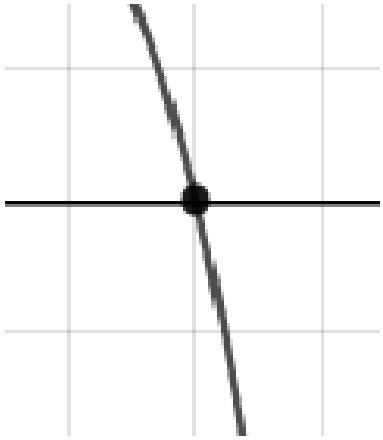
D. $13x^{10}(x-1)^8(x+4)^{11}$

E. $4x^5(x-1)^6(x+4)^9$

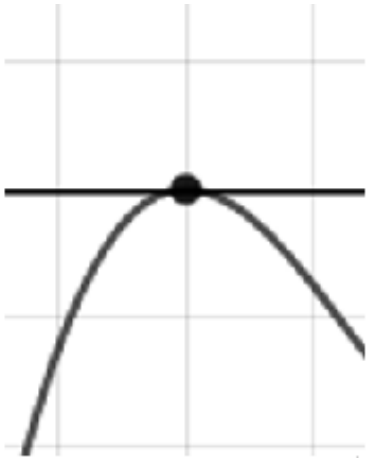
---

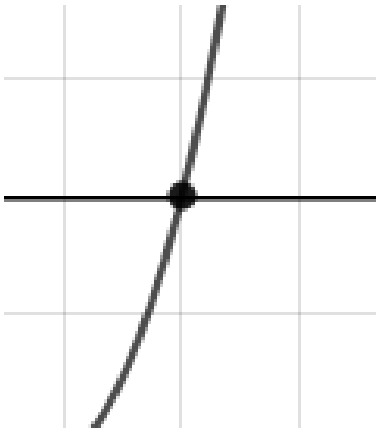
16. Describe the zero behavior of the zero $x = -7$ of the polynomial below.

$$f(x) = -5(x-2)^6(x+2)^4(x+7)^6(x-7)^5$$

A. 

C. 

B. 

D. 

E. None of the above.

---

17. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in

the form $x^3 + bx^2 + cx + d$.

$$-3 + 2i \text{ and } -4$$

A. $b \in [10, 19], c \in [32, 39],$ and $d \in [51, 63]$

B. $b \in [-1, 3], c \in [4, 8],$ and $d \in [11, 17]$

C. $b \in [-1, 3], c \in [-4, 3],$ and $d \in [-12, -5]$

D. $b \in [-11, -7], c \in [32, 39],$ and $d \in [-52, -50]$

E. None of the above.

---

18. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{7}{5}, \frac{-5}{2}, \text{ and } \frac{1}{2}$$

A. $a \in [18, 21], b \in [65, 73], c \in [23, 32],$ and $d \in [-35, -33]$

B. $a \in [18, 21], b \in [8, 17], c \in [-95, -77],$ and $d \in [33, 37]$

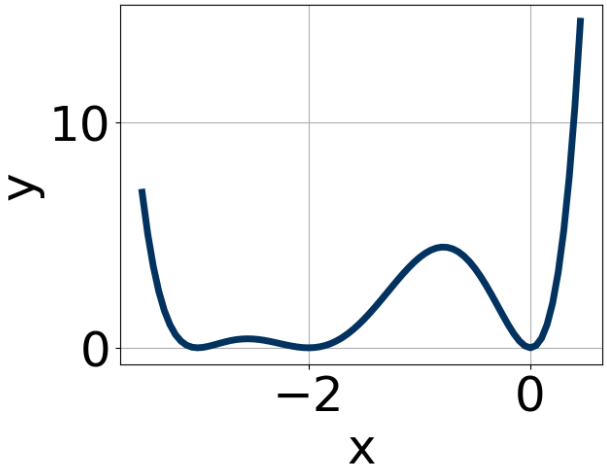
C. $a \in [18, 21], b \in [8, 17], c \in [-95, -77],$ and $d \in [-35, -33]$

D. $a \in [18, 21], b \in [-33, -27], c \in [-68, -57],$ and $d \in [33, 37]$

E. $a \in [18, 21], b \in [-18, -3], c \in [-95, -77],$ and $d \in [-35, -33]$

---

19. Which of the following equations *could* be of the graph presented below?



A. $14x^{11}(x+3)^6(x+2)^7$

B. $16x^{10}(x+3)^4(x+2)^{11}$

C. $-4x^8(x+3)^8(x+2)^4$

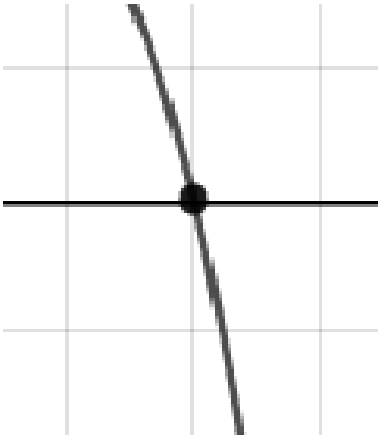
D. $8x^6(x+3)^{10}(x+2)^{10}$

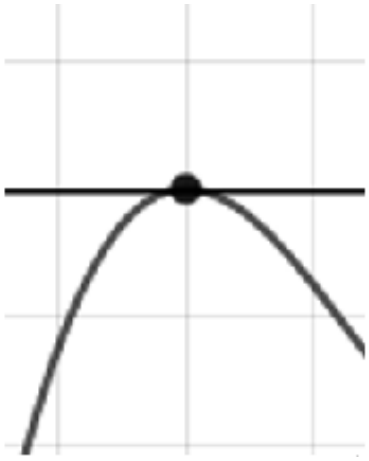
E. $-5x^8(x+3)^6(x+2)^7$

---

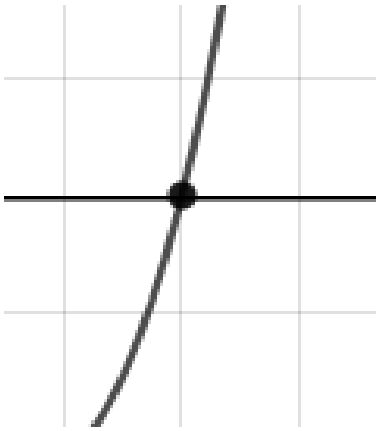
20. Describe the zero behavior of the zero $x = 9$ of the polynomial below.

$$f(x) = -3(x+9)^6(x-9)^{11}(x-5)^8(x+5)^9$$

A. 

B. 

C. 

D. 

E. None of the above.

---

21. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-5}{2}, \frac{4}{3}, \text{ and } -1$$

A. $a \in [1, 10], b \in [13, 15], c \in [-15, -4],$ and $d \in [10, 26]$

B. $a \in [1, 10], b \in [-2, 5], c \in [-31, -24],$ and $d \in [-22, -12]$

C. $a \in [1, 10], b \in [-14, -11], c \in [-15, -4],$ and $d \in [10, 26]$

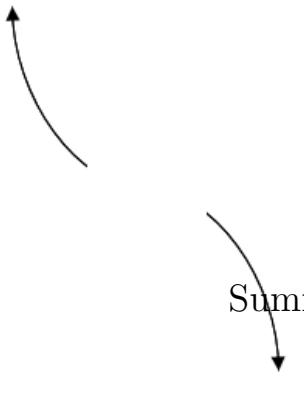
D. $a \in [1, 10], b \in [13, 15], c \in [-15, -4],$ and $d \in [-22, -12]$

E. $a \in [1, 10], b \in [-19, -15], c \in [-3, -2],$ and $d \in [10, 26]$

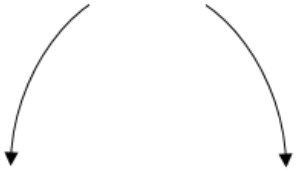
---

22. Describe the end behavior of the polynomial below.

$$f(x) = 2(x-3)^5(x+3)^{10}(x+7)^4(x-7)^5$$

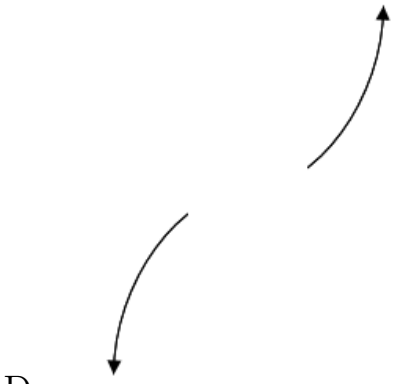
A. 

B.



C.

D.



E. None of the above.

---

23. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-3 - 5i \text{ and } -4$$

A. $b \in [-11, -8], c \in [57.4, 58.57],$ and $d \in [-141, -128]$

B. $b \in [1, 5], c \in [8.96, 9.07],$ and $d \in [16, 25]$

C. $b \in [9, 15], c \in [57.4, 58.57],$ and $d \in [136, 145]$

D. $b \in [1, 5], c \in [6.8, 8.11],$ and $d \in [12, 18]$

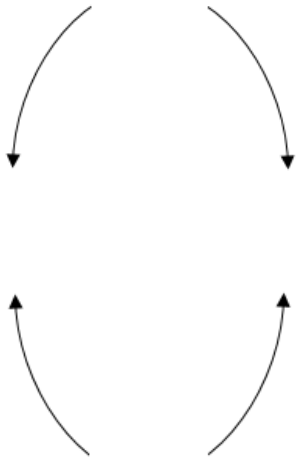
E. None of the above.

---

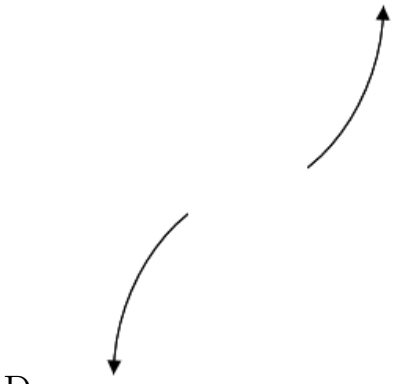
24. Describe the end behavior of the polynomial below.

$$f(x) = -2(x-8)^4(x+8)^5(x+4)^2(x-4)^2$$

B.



D.

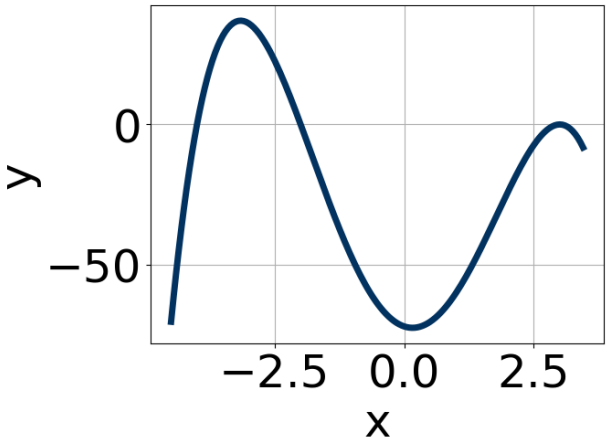


C.

E. None of the above.

---

25. Which of the following equations *could* be of the graph presented below?



A. $-2(x-3)^6(x+4)^{10}(x+2)^5$

B. $6(x-3)^{10}(x+4)^{11}(x+2)^7$

C. $19(x-3)^6(x+4)^9(x+2)^{10}$

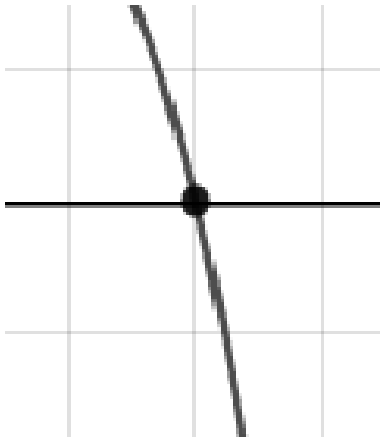
D. $-19(x-3)^9(x+4)^6(x+2)^{11}$

E. $-14(x-3)^8(x+4)^{11}(x+2)^5$

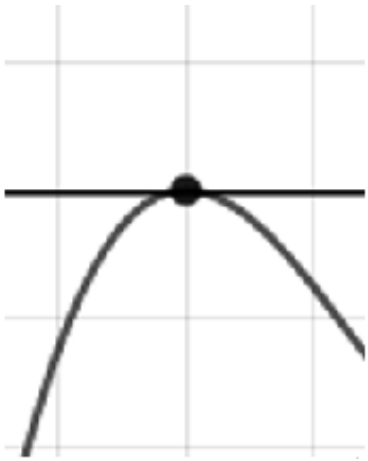
---

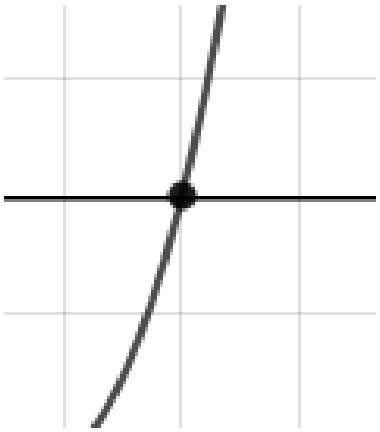
26. Describe the zero behavior of the zero $x = 9$ of the polynomial below.

$$f(x) = 2(x+5)^4(x-5)^2(x+9)^{11}(x-9)^8$$

A. 

C. 

B. 

D. 

E. None of the above.

---

27. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$5 + 3i \text{ and } -2$$

A. $b \in [-3, 4], c \in [-1, 3],$ and $d \in [-8, -3]$

B. $b \in [5, 14], c \in [7, 19],$ and $d \in [-75, -65]$

C. $b \in [-3, 4], c \in [-7, -2],$ and $d \in [-10, -8]$

D. $b \in [-12, -7], c \in [7, 19],$ and $d \in [67, 75]$

E. None of the above.

---

28. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-2}{3}, \frac{7}{3}, \text{ and } 6$$

A. $a \in [3, 10], b \in [-71, -67], c \in [69, 84],$ and $d \in [82, 94]$

B. $a \in [3, 10], b \in [-71, -67], c \in [69, 84],$ and $d \in [-86, -79]$

C. $a \in [3, 10], b \in [66, 74], c \in [69, 84],$ and $d \in [-86, -79]$

D. $a \in [3, 10], b \in [-43, -34], c \in [-106, -100],$ and $d \in [82, 94]$

E. $a \in [3, 10], b \in [-81, -79], c \in [175, 180],$ and $d \in [-86, -79]$

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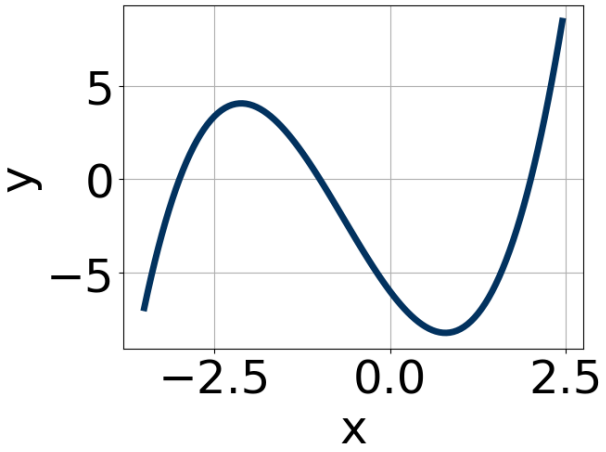
29. Which of the following equations *could* be of the graph presented below?



A. $12(x-2)^6(x+3)^5(x+1)^7$

B. $20(x-2)^7(x+3)^5(x+1)^9$

C. $-17(x-2)^4(x+3)^7(x+1)^5$

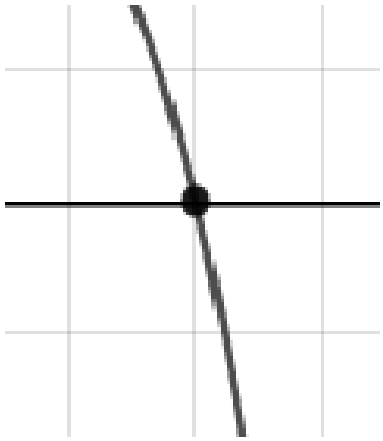
D. $-14(x-2)^7(x+3)^{11}(x+1)^7$

E. $9(x-2)^4(x+3)^6(x+1)^9$

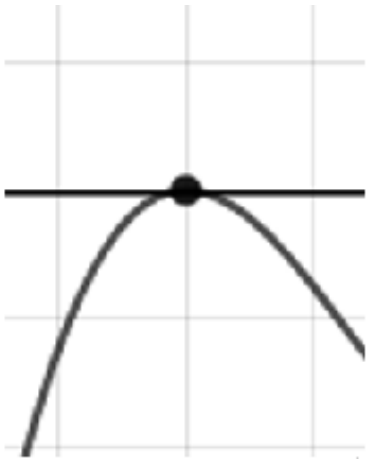
---

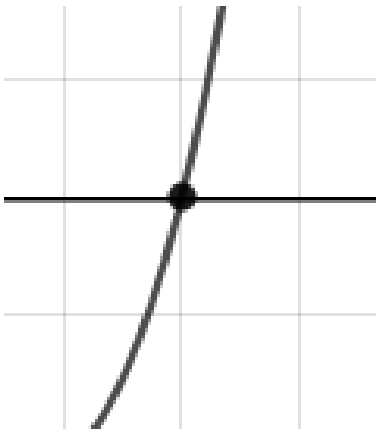
30. Describe the zero behavior of the zero $x = 4$ of the polynomial below.

$$f(x) = 5(x-4)^9(x+4)^{10}(x-7)^9(x+7)^{10}$$

A. 

C. 

B. 

D. 

E. None of the above.
